

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 August 2005 (04.08.2005)

PCT

(10) International Publication Number
WO 2005/071330 A1

(51) International Patent Classification⁷: **F25B 39/04**

(21) International Application Number:
PCT/JP2005/001306

(22) International Filing Date: 25 January 2005 (25.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-018412 27 January 2004 (27.01.2004) JP
60/540,335 2 February 2004 (02.02.2004) US

(71) Applicant (for all designated States except US): **SHOWA DENKO K.K.** [JP/JP]; 13-9, Shiba Daimon 1-chome, Minato-ku, Tokyo 1058518 (JP).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **OGASAWARA, Noboru** [JP/JP]; c/o SHOWA DENKO K.K., OYAMA REGIONAL OFFICE, 480, Inuzuka 1-chome, Oyama-shi, Tochigi 3238678 (JP).

(74) Agents: **HIBI, Norihiko** et al.; c/o KISHIMOTO & CO., 3rd Floor, Inaba Building, 13-18, Nishishinsaibashi 1-chome, Chuo-ku., Osaka-shi, Osaka 5420086 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

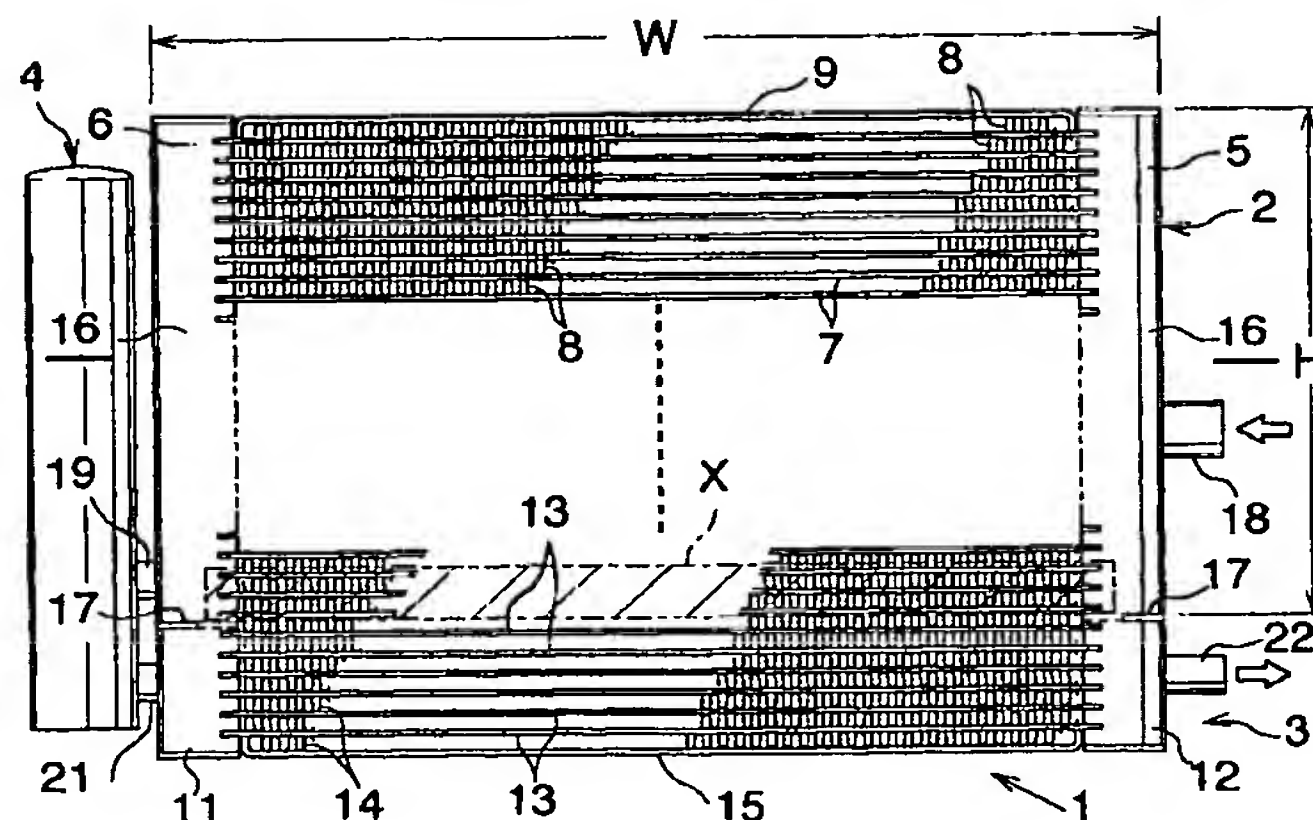
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: **CONDENSER**



(57) Abstract: A condenser comprises an inlet header 5 and an outlet header 6 spaced apart from each other and extending vertically, a plurality of flat refrigerant tubes 7 arranged one above another in parallel at a spacing between the two headers 5, 6 and joined at opposite ends thereof to the respective headers 5, 6, and fins 8 provided between respective adjacent pairs of refrigerant tubes 7. The inlet header 5 has a refrigerant inlet for admitting a refrigerant into interior thereof therethrough, and the outlet header 6 has a refrigerant outlet for causing the refrigerant to flow out therethrough. The refrigerant as admitted into the inlet header 5 through the inlet being flows through the refrigerant tubes 7 toward the outlet header 6. The number of refrigerant tubes 7 positioned below the center of the refrigerant inlet with respect to the vertical direction is up to 21, preferably up to 16, more preferably up to 7. The condenser can be prevented from becoming impaired in condensation performance when the refrigerant has a compressor lubricant incorporated therein.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.